

private, the mechanism is always the same. A caoutchouc bellows, like that used in Walker's pneumatic air-bells, is in communication with the main pipes. Every minute the pressure of the air raises it (Fig. 2); this bellows acts on a lever which draws a wheel of sixty teeth, in the axis of which is fixed the minute-hand. The wheel makes one-sixtieth of a revolution; a ratchet-click, shown on the left of the toothed wheel, prevents any return of the wheel. The movement of the hour-hand is effected by means of a small train of wheels, which is not represented in the figures. This small and very simple mechanism may be placed with the greatest facility in the interior of existing clocks, without changing the external form, substituting it for the old movement.

By means of a second bellows, the function of which is to wind up the bell of a pneumatic clock on a slightly different system, we may establish striking clocks. The price of the former to subscribers is 5 centimes a day, the striking clocks costing 6 centimes.

In Fig. 3 is represented the pneumatic clock of the Place de la Madeleine, furnished with its three dials, the movement of each of which is independent. The letters are clear on a blue ground. At night a jet of gas lights the interior, and the hour is clearly discernible at a considerable distance.

#### NOTES

WE have much pleasure in stating that Her Majesty has been graciously pleased to grant to the widow of John Allan Brown a pension of 75*l.* per annum. In NATURE, vol. xxi. p. 112, will be seen a full account of the life and works of that distinguished magician and meteorologist, whose life may truly be said to have been sacrificed through his devotion to the cause of scientific research.

THE following grants have been made from the Research Fund of the Chemical Society:—10*l.* to Mr. Kingzett for experiments on the atmospheric oxidation of phosphorus; 25*l.* to Mr. Watson Smith for the investigation of the di-naphthyls and phenyl naphthalene; 25*l.* to Messrs. Bailey and Munro for investigations of the colour reactions of certain metals and metallic solutions.

MR. AUBERON HERBERT is anxious to preserve our ancient monuments, but thinks the method proposed in Sir John Lubbock's Bill all wrong and unnecessarily harassing; indeed in his letter in Tuesday's *Daily News* he scents communism in Sir John's enterprise. He deprecates Government interference at all, and thinks the only effectual and enlightened method to be the education of the people into an intelligent respect for all our ancient monuments, a respect which would be a sufficient guarantee for their protection. Might not Mr. Herbert get Lord Norton to compile a series of reading-lessons on archaeology after his lordship has completed the botanical reading-book to which we referred last week? These lessons might take practical effect in the course of a generation or two, by which time probably there would be no ancient monuments for popular protection. The obtuseness of Mr. Herbert's letter is almost phenomenal.

UNIVERSITY COLLEGE, London, is anxious to complete its buildings, and in connection with this purpose a meeting was held at the Mansion House last Friday. We have frequently had occasion to speak of the great services rendered by the institution to the raising and broadening of education in this country. It has not only itself aimed to carry out a high standard of education, but has given a strong and healthy impulse to older institutions, and led, directly or indirectly, to the establishment of other institutions in which science has its fair place. Of the desirability of completing the buildings of Uni-

versity College there can be little doubt. The sum required is large—105,000*l.*; but if Edinburgh could raise 90,000*l.* for a similar purpose surely the wealthiest city of the wealthiest country in the world need have little difficulty in raising the sum required. Of this sum 20,000*l.* has already been subscribed; about the balance we trust there will be no difficulty.

IN connection with the recent meeting to raise funds for the completion of University College buildings, Prof. Ray Lankester writes to yesterday's *Times*, animadverting in strong terms on the scandalous misappropriation of the funds left by Sir Thomas Gresham "for the purpose of providing a college which should rival the Universities of Oxford and Cambridge in the completeness of its appointments and bring the highest education to the very doors of the citizens of London." Prof. Lankester suggests that the present representatives of the Corporation, who appear so anxious to promote the educational interests of the metropolis, should restore "to University education in London a fair portion of the sum which the Corporation of London, in days long past, diverted to its own benefit from Sir Thomas Gresham's trust." But could not the Gresham funds be included in the inquiry of the Commission now being appointed by Government to investigate the whole question of the City Corporations? If not, it ought to be.

TWO important accessions have recently been received by the Herbarium of the Royal Gardens, Kew. The corporation of Carlisle has transferred to it the herbarium of Dr. Goodenough, who was formerly Bishop of the Diocese, and who died in 1827. This is rich in specimens of plants cultivated at Kew and Chelsea in the end of the last century, but which have hitherto been very imperfectly represented in the Kew Herbarium. The very extensive collections of mosses accumulated by the late Prof. Schimper of Strassburg, and upon which his well-known works upon this group of plants were based, has been purchased (together with the accompanying drawings and notes) from Prof. Schimper's family by the Baroness Burdett-Coutts, and also presented to Kew.

DR. M. C. COOKE having been placed by the India Office at the disposal of the authorities of the Royal Gardens, Kew, has now entered upon his duties as cryptogamist attached to the Herbarium, and will for the present take charge of the collections of non-vascular cryptogams.

MR. H. A. ROLFE, lately a gardener in the employ of the Royal Gardens, Kew, has been appointed by the Civil Service Commissioners, after a competitive examination, to the vacant post of second assistant in the Herbarium of the same establishment.

DR. WOODWARD has been appointed keeper of the geological department of the British Museum in succession to Mr. Waterhouse, who resigned about three months ago. Dr. Woodward has occupied the position of assistant-keeper in the department for many years, and is the editor of the *Geological Magazine*, in which, as well as in the *Journal of the Geological Society*, he has published numerous memoirs.

MANY lessons will, and already have been, drawn from the unprecedented explosion of gas in London on Monday; the results were disastrous enough, but we may congratulate ourselves that they were no worse. The science of the explosion is simple enough, as the daily papers have been telling the public; and when science is properly taught in our elementary schools such accidents can only be due to perversity, not lack of knowledge. We recommend this explosion and its immediate cause, to the consideration of Lord Norton.

OUR readers may remember that some months ago Sir William Thomson made several valuable suggestions as to the readjust-

ment of our present system of lighting our coasts, which, he maintained, is a fruitful source of danger to navigation. A Parliamentary paper has just been issued containing a correspondence between Lloyd's Committee and the Trinity House on these suggestions. Naturally the Elder Brethren of the Trinity House attempt to show that their system is by no means so unsatisfactory as Sir William Thomson maintains it is, though they admit it is by no means perfect. They assured Lloyd's Committee of two things—(1) that the lighthouse system was not in the crude state which Sir William Thomson appeared to imply, and (2) that its present custodians were actuated by a very earnest desire yet further to simplify and improve it. The Committee of Lloyd's remarked, in their reply, dated January 16, 1880, that they were glad to find that they were at one with the Elder Brethren in thinking that some distinctions more marked than those already existing would be useful. They had no special interest in Sir William Thomson's plan, but they had always understood that his inventions and improvements in electrical apparatus, the mariner's compass, and the sounding machine had been of great service to the community at large. We suspect there is much more in Sir William Thomson's animadversions and suggestions, the result of the practical experience of an eminent man of science, than the Elder Brethren of the Trinity House are willing to admit.

THE engineers of the St. Gotthard Tunnel are stated to be in a fair way to overcome the difficulty arising from the falling in of the roof in the part known as the "windy stretch." This stretch, which is 200 metres long, and situated almost directly under the plain of Andermatt, passes through strata composed alternately of gypsum and aluminous and calcareous schists, which absorb moisture like a sponge and swell on exposure to the atmosphere. It has given the contractors immense trouble, and has fallen in so often that it was seriously proposed a short time ago to allow it to collapse, and make a bend so as to avoid the "windy stretch" altogether. The expedient now adopted, which has so far been successful, is the rebuilding of the supporting masonry in rings of solid granite. The rings are each four metres long, so that in the event of any one of them giving way the others will not thereby be affected. The building is constructed slowly and with the utmost care; no imperfect stones are allowed to be used; the masonry is perfect, and the walls of extraordinary thickness—in the parts most exposed to pressure not less than ten feet. At the beginning of June only 34 metres of the "windy stretch" required to be revaulted.

M. TRESCA, whose name has been connected with the Conservatoire des Arts et Métiers for about twenty-five years, no longer belongs to that establishment. His office has been suppressed by a recent decision of M. Tisard, the Minister of Agriculture and Commerce. This unexpected resolution has created some sensation in the Paris scientific world.

WE have received the first volume of the *Archives of the Deutsche Seewarte*, a neatly-printed quarto volume of above 300 pages, with numerous plates, containing an account of the first four years' working of the Meteorological Office at Hamburg, 1875-78, under the able guidance of Dr. G. Neumayer, well known as the former Superintendent of the Flagstaff Observatory at Melbourne. The volume contains some elaborate reports, among which may be specially mentioned an account of the activity of the Office in the departments (1) of Marine Meteorology, (2) of Weather Telegraphy and Storm Warnings, (3) a Report on the Testing of Chronometers, and (4) a paper on the Non-periodical Monthly Variations of the Barometer. Subsequent annual volumes are promised in regular succession, and we look forward with confidence that an addition of much useful knowledge on the subject of meteorology generally will be gained by their publication. The *Seewarte* already possesses a library

of 9,400 volumes, and includes that formerly belonging to Prof. Dove of Berlin, which was acquired at a cost of 1,500.

A CURIOUS work, impressively illustrative of the "science" of the Dark Ages, has just been published at Berlin, under the title of "Compendium der Naturwissenschaften an der Schule zu Fulda in IX. Jahrhundert." Its purpose is to expound the works of Rhaban, the celebrated Abbé of Fulda (788-856). The Abbé, under the title of *De Universo*, published what would now probably be classed as an encyclopaedia, and as we have said, its divisions and contents are a curious illustration of the state of systematic knowledge at the time it was written. Book I. treats of the Trinity and Angels; Book II. Patriarchs and Prophets; Book III. Men and Women spoken of in the Old Testament; Book VI. Man and the various parts of the Human Body; Book IX. the World, Atoms, Elements, the Sky, Stars, Meteors; Book X. the Almanack and Feasts; Book XII. the Earth; Book XIII. the Vertical (?) Parts of the Earth; Book XV. Philosophers, Poets, Sorcerers, Idols, Pagans; Book XVIII. Measures, Weights, Numbers, Music, Medicine, and Diseases; Book XX. War, Horses and Ships, &c. Of course the book is full of curious mythological and other mysteries, a remarkable feature, however, being the important part given to etymology; indeed it would almost seem as if all science consisted in good etymology.

DR. R. F. HUTCHINSON of Mussooree, India, writes that on the afternoon of May 25 a hail-storm, remarkable for its fury, extensive area, and size and structure of its stones, enveloped that station, and Deyrab and Rajpore, at the foot of the hill. A discharge of stones as large as pigeon-eggs opened the attack, and this was followed by a continuous downpour of stones, oblate spheres as large as small marbles. The whole station was penetrated by these, and it presented the appearance of being strewn broadcast with acidulated drops. These stones were of pure, clear ice, and, barring their shape, quite amorphous. Not so the large stones, whose structure and mode of formation were very puzzling. First, an opaque nucleolus surrounded by a concentric nucleus of clear ice, and this by a radiating periphery. The nucleolus being opaque, was rapidly frozen; it must then have moved through alternate layers of hot and cold air to have received the concentric accretions of clear ice. The radiating periphery (which was translucent, but not transparent) quite puzzles our correspondent.

A VALUABLE paper of observations of the aspect of Mars during his recent opposition, of the red spot of Jupiter, and the spots of Venus, by M. Terby, appears in the Belgian Academy's *Bulletin* (No. 3). The most delicate part of the work is that relating to the spots of Venus, of which he supplies ten carefully executed drawings.

CAPTAIN DOUGLAS GALTON gives an address to-day in connection with the Sanitary Institute at the Royal Institution.

THE 126th annual meeting of the Society of Arts was held on the 30th ult., when the Report was presented and officers elected. The Society is in a more satisfactory condition than at any previous period.

*Scientific Practice* is the title of a periodical published three times a year for the students of the School of Practical Engineering at the Crystal Palace. No. 7, which we have received, contains several papers likely to interest young engineers.

MR. W. SAVILLE KENT's long-promised "Manual of the Infusoria" will be published by Mr. David Bogue. The complete MS. and drawings are in the printer's hands. The work will be issued in six monthly parts, the first of which is to be ready in October.

A NEW list of members of the Institution of Civil Engineers has just been issued, from which it appears that there are now on the books 1,217 members, 1,299 associate members, 579 associates, 18 honorary members, and 657 students—together 3,770 of all classes. At the same period last year the numbers of the several classes were 1,148, 1,200, 622, 17, and 591, making a total of 3,578, showing an increase at the rate of nearly 5½ per cent. During the past session the elections have comprised 2 honorary members, 43 members, 129 associate members, and 15 associates; and 160 students have been admitted.

A COMMISSION appointed on November 27, 1879, has visited the five French provincial observatories. A report has been written by M. Lœwy, sub-director of the Paris Observatory, discussed at a meeting of the directors of the establishment, approved by the Minister of Public Instruction, and published by the *Journal Officiel* on June 29.

IN a report which he has lately sent to the Foreign Office, the acting Consul-General at Bangkok remarks that the year 1879 will long be memorable in the provinces of Battambong and Chantaboon for the discovery of valuable sapphire mines in that part of Siam. Mines of inferior value have long been known in the neighbourhood, and about five years ago new mines were discovered by a native hunter. Being, however, in a very remote and secluded position, it was long before their fame spread to the Burman and Indian gem-traders and miners. Eventually they became more widely known, and large numbers flocked to them, especially from British Burmah. The largest sapphire hitherto found weighed, according to Mr. Newman, 370 carats in the rough, and when cut turned out 111 carats of the finest water. The ruby, onyx, and jade are also found in the district, but are apparently of inferior quality.

THE *Liverpool Courier* understands that the telephone has been successfully laid down from Childwall Church, Liverpool, to the house of a lady half a mile off who is unable to go out; the chants, hymns, and lessons are distinctly heard, but only fragmentary sentences of the sermon can be caught.

WE see from the *Otago Witness* of May 22 that Prof. Black of Otago University has commenced a second course of public lectures on chemistry, in continuation of the course last winter, to which we referred as having been attended by teachers from all parts of the province of Otago, many of them coming distances of sixty, seventy, eighty, and ninety miles. The present course promises to be quite as successful. The *Witness*, we are informed, publishes the lectures in response to several requests, and in view of the heartiness with which the course (both of last year and this) has been received.

MR. J. LEE JARDINE writes from Capel, Surrey:—"I felt what may have been the tremor of an earthquake on Sunday, June 27, at 9 p.m. I was sitting with friends talking and reading on the ground floor of a house close to a road, and noticed a low rumbling lasting two or three seconds; this was repeated five or six times in the course of four or five minutes, sounding so like the noise of wheels that I watched for a cart, but in vain. The last three or four times the rumbling was accompanied by a slight vibration sensible only to the feet. It was felt also by one of my friends, who remarked upon the curious sensation."

THERE was a severe shock of earthquake at Brieg, Switzerland, on Sunday. Many buildings were injured, but, so far as is known, no lives were lost. The movement was also much felt at Zermatt and Belalp, and very slightly at Geneva.

M. FERRY, French Minister of Public Instruction, presided at the first meeting of a commission established for the improvement of popular publications. It has been resolved that a sub-commission shall decide what works shall be rewarded and what subjects proposed by way of competition.

IN a work published by Dr. Ricoux of Philippeville, Algeria, on "Demographie figurée de l'Algérie," it is proved that marriages are more prolific than in France, the mean number of children being 3·67 in the colony, as contrasted with 3·07, in the mother country. In the first twenty years after the French occupation it was taken for granted that European children could not be reared in the colony. The increase of the European population is very remarkable; in 1830, 600; ten years afterwards, 27,000; twenty years, 125,000; thirty years, 200,000; forty years, 271,000. In 1880 the number is not yet known, but is probably 400,000, having been found 323,000 in 1876.

WE have received the Calendar of the "Tokio Daigaku," or University of Tokio for 1879-80. This university seems to be quite as complete in all its departments as any similar institution in this country, and the education provided seems, to judge from the examination papers, thorough. The place given to science is what it ought to be, on an equal footing with any other department in all respects. An interesting historical summary is prefixed of the introduction of Western learning into Japan.

THE *Report* of the Miners' Association of Cornwall and Devon for 1879 shows that the Association continues to do good work among the mining population of these two counties. The numbers attending the classes continue to increase, and the instruction given is well calculated to be of great service to a mining population. The *Report* contains a paper by Mr. A. T. Davies on the "Phenomena of the Heaves or Faults in the Mineral Veins of St. Agnes."

WE have received a very favourable *Report* (the 22nd) from the East Kent Natural History Society. The *Report* contains several good papers read at the meetings of the Society, the most important and the longest being that of Capt. McDakin, "An Outline and Index to the Geology of East Kent."

WE are asked to state by Mr. Walter Baily (not Baillie) that in our report of the Physical Society last week, p. 210, second column, line 29, *notes* should be *nodes*.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus erythraeus*) from India, presented by Mr. Fred. Felix; a Banded Ichneumon (*Herpestes fasciatus*) from East Africa, presented by Mr. H. Hall; a Common Marmoset (*Hapale jaccus*) from Brazil, presented by Mr. T. Douglas Murray, F.Z.S.; a Java Sparrow (*Padda oryzivora*) from Java, a Spotted-sided Finch (*Amadina lathami*), a Chestnut-eared Finch (*Amadina castanotis*) from Australia, two Chestnut-bellied Finches (*Munia rubro-nigra*), a Yellow-bellied Liothrix (*Liothrix lutea*) from India, two Red-beaked Weaver Birds (*Quelea sanguinirostris*), a Crimson-crowned Weaver Bird (*Euplectes flammiceps*), a Paradise Whydah Bird (*Vidua paradisea*) from West Africa, a Brazilian Tanager (*Ramphocelus brasilius*) from Brazil, a Bearded Tit (*Calamonphilus biarmicus*), European, presented by Mr. St. Julien Arabin; two Common Peafowls (*Pavo cristata*) from India, presented by Miss Wedderburn; a Slender-billed Cockatoo (*Licmetis tenuirostris*) from South Australia, presented by Mr. H. F. Bussey; a Jaguar (*Felis onça*), two Huanacos (*Lama huanacos*), two Coypu Rats (*Myopotamus coypus*), two American Barn Owls (*Strix flammea*) from South America, deposited; a Cereopsis Goose (*Cereopsis novae-hollandiae*) from Australia, a Doubtful Toucan (*Ramphastos ambiguus*) from United States of Columbia, six Chinese Quails (*Coturnix chinensis*) from China, two American Kestrels (*Tinnunculus sparverius*) from America, an Ocellated Monitor (*Monitor ocellata*) from West Africa, purchased; a Red Deer (*Cervus elaphus*), a Reeves's Muntjac (*Cervulus reevesi*), born in the Gardens, three Upland Geese (*Bernicla magellanica*), bred in the Gardens.